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10/578,035

05/02/2006

Thomas Kuckelkorn

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278 7590 08/19/2008  
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EXAMINER

BERNSTEIN, DANIEL A

ART UNIT

PAPER NUMBER

4166

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/578,035	<b>Applicant(s)</b> KUCKELKORN ET AL.	
	<b>Examiner</b> DANIEL A. BERNSTEIN	<b>Art Unit</b> 4166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/2/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(f) he did not himself invent the subject matter sought to be patented.

2. Claims 1-12 rejected under 35 U.S.C. 102(e) as being anticipated by US

Patent No. 7,240,675 to Eickhoff.

The applied reference has a common inventor Eickhoff with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Eickhoff teaches:

#### In Reference to claim 1

A solar collector with an absorber tube (13), a concentrator which focuses solar radiation onto the absorber tube, and at least one radiation-permeable cladding tube (15) enclosing the absorber tube (13), compensation pieces (17)

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for length compensation being provided in connection areas (Column 3 lines 26-27) between the cladding tubes, wherein at least one mirror collar (20) which encloses the cladding tube (15) is located in the connection areas.

In Reference to claim 2

A parabolic trough collector as recited in claim 1 (see rejection of claim 1) with an absorber tube (13) fastened to a support (14), a parabolic reflector (11) which focuses solar radiation onto the absorber tube, and a plurality of radiation-permeable cladding tubes (15) enclosing the absorber tube (13), compensation pieces (17) for length compensation being provided in connection areas (Column 3 lines 26-27) between the cladding tubes (15), wherein a mirror collar (20) which encloses the cladding tube (15) and has a conical shape (20, Fig. 2) that extends--either entirely or partially--around the circumference of the cladding tube (15) is located in the connection areas (Column 3 lines 26-27).

In Reference to claim 3

The parabolic trough collector as recited in claim 2 (see rejection of claim 2), wherein the mirror collar (20) is composed of two conic surfaces (Fig. 4, 21 and 24) located next to each other and extending in opposite directions.

In Reference to claim 4

The parabolic trough collector as recited in claim 3 (see rejection of claim 3), wherein the conic surfaces (Fig. 4, 21 and 24) have different taper angles.

In Reference to claim 5

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A parabolic trough collector as recited in claim 2 (see rejection of claim 2), wherein the mirror collars (20) cover all or part of the compensation pieces (17) in the longitudinal direction of the cladding tube (15). (See Fig. 2)

In Reference to claim 6

The parabolic trough collector as recited in claim 5 (see rejection of claim 5), wherein two mirror collars (20) located next to each other enclose the entire length of a connection area. (See Fig. 4)

In Reference to claim 7

A parabolic trough collector as recited in claim 2 (see rejection of claim 2), wherein the mirror collar (20) extends for about half of the circumference of the cladding tube (15). (See Fig. 3)

In Reference to claim 8

The parabolic trough collector as recited in claim 2 (see rejection of claim 2), wherein the parabolic reflector (11) tracks the position of the sun via a single axis. (Column 4 lines 3-5)

In Reference to claim 9

The solar collector as recited in claim 1 (see rejection of claim 1), wherein the mirror collar (20) includes at least one planar surface (25, Fig. 3).

In Reference to claim 10

The solar collector as recited in claim 9 (see rejection of claim 9), wherein the planar surface (30) is oriented perpendicularly to the axis of the cladding tube (25, Fig.3).

In Reference to claim 11

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The solar collector as recited in claim 9 (see rejection of claim 9), wherein the planar surface (25) is an annular surface (Fig. 3).

In Reference to claim 12

The solar collector as recited in claim 9 (see rejection of claim 9), wherein the mirror collar (20) includes a plurality of planar surfaces located on a cone.

Fig. 3 shows a plurality of planar surfaces located on a cone.

3. Claims 1-12 rejected under 35 U.S.C. 102(f) because the applicant did not invent the claimed subject matter. See 102(e) rejection above and double patenting rejection below, where the inventive entities of the application are different from that of US Patent 7,240,675 to Eickhoff.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-16 rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 4,202,322 to Delgado et al. (Delgado) in view of US Patent No. 7,013,887 to Kuckelkorn et al. (Kuckelkorn) and in further view of US Patent No. 4,295,462 to Bunch (Bunch).

In Reference to claim 1

Delgado teaches a solar collector with an absorber tube (Fig. 1, receiver tube 25), a concentrator (collector assembly 20 a-d) which focuses solar

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radiation onto the absorber tube (25), and at least one radiation-permeable cladding tube (transparent tube 26) enclosing the absorber tube (25).

Delgado does not teach compensation pieces for length compensation being provided in connection areas between the cladding tubes, wherein at least one mirror collar which encloses the cladding tube is located in the connection areas.

Kuckelkorn teaches compensation pieces (Fig. 1, expansion compensation device 10) for length compensation being provided in connection areas between the cladding tubes.

Bunch teaches at least one mirror collar (Fig. 6, which shows secondary concentration devices 112 and 90 and Fig.7, 116).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to combine the compensation pieces of Kuckelkorn to the ends of Delgado in order to decrease the stress or load on the cladding tube. Furthermore, it would have been obvious to combine the mirror collar of Bunch to the ends of Delgado and covering the compensation pieces of Kuckelkorn to further deflect incoming radiation from the connection pieces to the absorber tube. This would be advantageous because it would further reduce heat at the connection points and reduce stress on the compensation pieces due to thermal expansion.

#### In Reference to claim 2

Delgado as modified above teaches a parabolic trough collector as recited in claim 1 (see rejection of claim 1) with an absorber tube (25) fastened to a

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support (11 and 38 a-d, fastens the entire collector module 10), a parabolic reflector (21 a-d) which focuses solar radiation onto the absorber tube (25), and a plurality of radiation-permeable cladding tubes (26) enclosing the absorber tube (25), compensation pieces (Kuckelkorn 10) for length compensation being provided in connection areas (Fig. 12 Delgado shows connection area) between the cladding tubes (25), wherein a mirror collar (Bunch 112 and 90) which encloses the cladding tube (25) and has a conical shape that extends--either entirely or partially--around the circumference of the cladding tube (Fig. 6 of Bunch shows a mirror collars 112 and 90 that extend entirely around the circumference of the tube) is located in the connection areas (see combination in rejection of claim 1).

In Reference to claim 3

Delgado as modified above teaches the parabolic trough collector as recited in claim 2 (see rejection of claim 2), wherein the mirror collar (Bunch, Fig. 6, 112 and 90) is composed of two conic surfaces (two surfaces of 92) located next to each other and extending in opposite directions.

In Reference to claim 4

Delgado as modified above teaches the parabolic trough collector as recited in claim 3 (see rejection of claim 3), wherein the conic surfaces have different taper angles (Bunch Fig. 6, 92 has two pieces comprising the mirror collar in which they have different taper angles).

In Reference to claim 5



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A parabolic trough collector as recited in claim 2 (see rejection of claim 2), wherein the mirror collars (Bunch 112 and 90) cover all or part of the compensation pieces (Kuckelkorn 10) in the longitudinal direction of the cladding tube (Delgado 26).

In Reference to claim 6

Delgado as modified above teaches the parabolic trough collector as recited in claim 5 (see rejection of claim 5), wherein two mirror collars (Bunch 92, Fig. 6) located next to each other enclose the entire length of a connection area (see rejection of claim 1, in which the combination of Delgado, Kuckelkorn and Bunch would enclose the entire length of a connection area).

In Reference to claim 7

Delgado as modified above teaches a parabolic trough collector as recited in one claim 2 (see rejection of claim 2), wherein the mirror collar (Bunch 112 and 90) extends for about half of the circumference of the cladding tube (Delgado 26). The mirror collar of Bunch fulfills the requirement of extending "about half" of the circumference of the cladding tube.

In Reference to claim 8

Delgado as modified above teaches the parabolic trough collector as recited in one claim 2 (see rejection of claim 2), wherein the parabolic reflector (Delgado, Fig. 1, 10) tracks the position of the sun via a single axis (Column 6 lines 39-42).

In Reference to claim 9

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Delgado as modified above teaches the solar collector as recited in claim 1 (see rejection of claim 1), wherein the mirror collar (Bunch, Fig. 6, 112 and 90, Fig.7, 116) includes at least one planar surface (multiple planar surfaces of 116).

In Reference to claim 10

Delgado as modified above teaches the solar collector as recited in claim 9 (see rejection of claim 9), wherein the planar surface (Bunch, multiple planar surfaces of 116) is oriented perpendicularly to the axis of the cladding tube (Delgado 26). The angle or orientation of the planar surfaces relative to the cladding tube is an obvious design choice, because the angle of the reflective surface depends solely on the incidence angle of light hitting the panels. Based on the orientation of the solar panel it would be obvious to design the planar surface of the mirror collar to achieve the optimal amount of light reflected onto the cladding tube.

In Reference to claim 11

Delgado as modified above teaches the solar collector as recited in claim 9 (see rejection of claim 9), wherein the planar surface (surface of 116) is an annular surface (Fig. 8 shows cross section of 116 as an annular surface).

In Reference to claim 12

Delgado as modified above teaches the solar collector as recited in claim 9 (see rejection of claim 9), wherein the mirror collar (Bunch, Fig. 6, 112 and 90, Fig.7, 116) includes a plurality of planar surfaces (Fig. 7) located on a cone.

In Reference to claim 13

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Delgado as modified above teaches the solar collector as recited in claim 12 (see rejection of claim 12), wherein the mirror collar includes two through eight planar surfaces (Fig. 8 shows eight planar surfaces).

In Reference to claim 14

Delgado as modified above teaches the solar collector as recited in claim 13 (see rejection of claim 13) with a parabolic reflector (Delgado Fig.1, 21) composed of at least two parabolic segments (21 a-d each show 4 segments), wherein at least one planar surface (surface of Fig. 7) is assigned to at least one parabolic segment. The applicant discloses that “assigned” means that the planar surface is located on the conical surface such that the focal line associated with the parabolic segment strikes the relevant planar surface. The combination explained above would be capable of performing the aforementioned function.

In Reference to claim 15

Delgado as modified above teaches the solar collector as recited in claim 1 (see rejection of claim 1), wherein the  $h/L$  ratio is between 0.3 to 1, with  $h$  being the height of the mirror collar perpendicular to the axis of the cladding tube (15) and  $L$  being the length of the connection area. Where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation (refer to section 2144.05 of the MPEP).

In Reference to claim 16

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Delgado as modified above teaches the solar collector as recited in claim 1 (see rejection of claim 1), wherein the mirror collar (Bunch, Fig. 6, 112 and 90) is composed of aluminum. Bunch teaches making inner surface 24 out of aluminum and therefore, it would be obvious to use the aluminum surface of Bunch on the mirror collar to achieve a high degree of reflectivity.

### ***Double Patenting***

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-7 rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No. 7,240,675 to Eickhoff. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims describe the same

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invention. The application claims 1-7 are broader recitations of patent claims 1-8 of Eickhoff.

For example, patent claim 1 recites a parabolic trough collector which corresponds to the solar collector of application claim 1. It further recites an absorber tube, a reflector in patent claim 3 which corresponds to the concentrator, and glass tubes which correspond to radiation permeable cladding tubes. Also, patent claim 1 recites flexible unions for compensating different length changes which corresponds to compensation pieces. Finally, patent claim 1 recites conical collars having mirror surfaces which correspond to at least one mirror collar.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL A. BERNSTEIN whose telephone number is (571)270-5803. The examiner can normally be reached on Monday-Friday 8:00 AM - 5:00 PM EDT.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Bomberg can be reached on 571-272-4922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DAB

August 14, 2008

/Fenn C Mathew/  
Primary Examiner,